DETAILED ACTION

1. This communication is responsive to Amendment filed 03/10/2010.

2. Claims 21-25 and 32-36 are pending in this application. Claims 21 and 36 are independent claims. In Amendment, claims 21 and 36 are cancelled. This Office Action is made final.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 21-25 and 32-36 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Re claim 21, the newly added limitation "wherein a control signal is used to change the variable transition speed of X(n)" is considered as new subject matter which was not described in the original specification. The only paragraph [0021] briefly mentions the transition speed of X[n] and scaling coefficient "a" but nothing in the specification mentions or details about the control signal is used to change the variable transition speed of X[n]. Claim 36 has similar rejection.

Re claim 34, the newly added limitation "wherein the value of the scaling coefficient is different from the error value" is considered as new subject matter which was not described in the original specification since nothing in the original specification clearly defines or addresses that the scaling coefficient must be different from the error value. Claim 36 has similar rejection.

Thus, claims 22-25, 32-33 and 35 are also rejected for being dependent on the rejected base claim 21.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 21-25 and 32-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collier et al. (U.S. 5,404,405) in view of Matsui (U.S. 4,716,589) in further view of Simanapalli et al. (U.S. 6,002,726).

Re claim 21, Collier et al. disclose in Figure 1 a system for producing a pulse code modulation (PCM) signal (e.g. abstract, Figure 1 and col. 1 lines 18-41), comprising: a first filter configured to produce an in-phase signal I(n) from a signal (e.g. by component 8 in Figure 1 and col. 2 lines 63-68); a second filter configured to produce a quadrature-phase signal Q(n) from the in-phase signal I(n) (e.g. the Hilbert filter 18 in Figure 1), a FM demodulator (e.g. all the components 18, 20, 22, 24, 26, 28, 30 and 34 in

Figure 1) configured to produce a FM demodulated signal substantially equal to Z(n)/X(n), wherein Z(n) and X(n) are functions of I(n) and Q(n) (e.g. by output of components 30 and 34 in Figure 1), the FM demodulator including a denominator device that estimates a value 1/X(n) (e.g. for computing the I^2+Q^2 in component 30 in Figure 1); and a third filter configured to produce the PCM signal from the FM demodulated signal (e.g. output of the filters 40 and 42 in Figure 1).

Collier et al. fail to disclose two limitations (1) the denominator device estimates a value 1/X(n) based at least in part on a prior estimated value of 1/X(n) and a variable transition speed of X(n) wherein a control signal is used to change the variable transition speed of X(n)) and (2) the signal is the secondary audio program (SAP). However, SAP is known in the art as clearly addressed in Matsui's reference. Matsui's reference discloses the SAP throughout the specification (e.g. col. 1 lines 14-51) with similar modulation/demodulation scheme. In addition, Simanapalli et al. clearly disclose the denominator device estimates a value 1/X(n) based at least in part on a prior estimated value of 1/X(n) and a variable transition speed of X(n) (e.g. Figure 3, particular component 78 wherein the transition speed occurs within the input value x(n) and the previous estimated value y(n-1) by the evaluated component 78) wherein a control signal is used to change the variable transition speed of X(n)) (e.g. component 78 in Figure 3 wherein r[n+1] = r[n]*(2-r[n]x[n+1]) which is the same as, by changing symbol, y[n] = y[n-1] * (2-y[n-1]x[n]) = y[n-1] + {y[n-1] – y[n-1]y[n-1]x[n]} = y[n-1] + y[n-1]*{1 - y[n-1]x[n]} which is exactly same as Figure 4 of the claimed invention).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to replace/add the signal with the SAP as clearly seen in Matsui's invention and the denominator device estimates a value 1/X(n) based at least in part on a prior estimated value of 1/X(n) and a variable transition speed of X(n) wherein a control signal is used to change the variable transition speed of X(n)) as seen in Simanapalli et al.'s invention into Collier et al.'s invention because it would enable to reproduce the information from the broadcasting signal efficiently (e.g. whole column 1 and col. 3 lines 51-68 in Matsui's reference and col. 2 lines 32-39 in Simanapalli et al.'s reference) .

Re claim 22, Collier et al. further disclose in Figure 1 Z(n) is substantially equal to [IQ'-I'Q] and X(n) is substantially equal to $[I^2+Q^2]$ (e.g. by component 30 in Figure 1 wherein I and Q are periodic signals).

Re claim 23, Collier et al. in view of Matsui further to disclose in Figure 1 the SAP signal is a constant magnitude signal, a sine wave, or a cosine wave (e.g. inherently for FM modulation scheme).

Re claim 24, Collier et al. further disclose in Figure 1 the first filter is a band pass filter (e.g. filter 8 in Figure 1 and col. 2 lines 63-68 for selective band).

Re claim 25, Collier et al. further disclose in Figure 1 the second filter is a Hilbert filter (e.g. by the filter 18 in Figure 1 for phase shifting the original signal I(n)).

Re claims 32-35, Collier et al. in view of Matsui fail to disclose the denominator devices estimates the value 1/X(n) based at least in part on the prior estimated value of 1/X(n) plus an error value wherein the error value is substantially equal to [1-X(n)/X(n-

1)] and the error value is scaled by a value of a scaling coefficient before being added to the prior estimated value of 1/X(n) and wherein the value of the scaling coefficient is different from the error value and wherein the value of the scaling coefficient is based on the variable transition speed of X(n). However, Simanapalli et al. disclose in Figures 2-3 the denominator devices estimates the value 1/X(n) based at least in part on the prior estimated value of 1/X(n) plus an error value wherein the error value is substantially equal to [1-X(n)/X(n-1)] and the error value is scaled by a value of a scaling coefficient before being added to the prior estimated value of 1/X(n) (e.g. Figure 3, particularly component 78) and wherein the value of the scaling coefficient is different from the error value (e.g. component 78 in Figure 3 wherein r[n+1] = r[n]*(2-r[n]x[n+1]) which is the same as, by changing symbol, y[n] = y[n-1] * (2-y[n-1]x[n]) = y[n-1] + {y[n-1] – y[n-1]y[n-1]x[n]} = y[n-1] + y[n-1]*{1 - y[n-1]x[n]} which is exactly same as Figure 4 of the claimed invention wherein) and wherein the value of the scaling coefficient is based on the transition speed of X(n) (e.g. Figure 2).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add the denominator devices estimates the value 1/X(n) based at least in part on the prior estimated value of 1/X(n) plus an error value wherein the error value is substantially equal to [1-X(n)/X(n-1)] and the error value is scaled by a value of a scaling coefficient before being added to the prior estimated value of 1/X(n) and wherein the value of the scaling coefficient is different from the error value and wherein the value of the scaling coefficient is based on the transition speed of X(n) as

seen in Simanapalli et al.'s invention into Collier et al. in view of Matsui's invention because it would enable to enhance the system performance (e.g. col. 2 lines 32-39).

Re claim 36, it is a system claim having similar limitations cited in claims 21 and 34-35. Thus, claim 36 is also rejected for being dependent on the rejection of rejected claims 21 and 34-35.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 21-25 and 32-36 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 3 and 9 of U.S. Patent No. 7,006,806 in view of Simanapalli et al.

Claims 1, 3 and 9 of Patent No. 7,006,806 contain similar elements of claims 21-25 and 32-36 of the instant application and thus anticipated the claims of the instant

application. these claims do not contain the limitations of the denominator devices estimates the value 1/X(n) based at least in part on the prior estimated value of 1/X(n) plus an error value wherein the error value is substantially equal to [1-X(n)/X(n-1)] and the error value is scaled before being added to the prior estimated value of 1/X(n) and a transition speed of X(n) and wherein the value of the scaling coefficient is based on the transition speed of X(n). However, Simanapalli et al. disclose in Figures 2-3 the denominator devices estimates the value 1/X(n) based at least in part on the prior estimated value of 1/X(n) plus an error value wherein the error value is substantially equal to [1-X(n)/X(n-1)] and the error value is scaled before being added to the prior estimated value of 1/X(n) (e.g. Figure 3, particularly component 78) and a transition speed of X(n) and wherein the value of the scaling coefficient is based on the transition speed of X(n) (e.g. Figure 2).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add the denominator devices estimates the value 1/X(n) based at least in part on the prior estimated value of 1/X(n) plus an error value wherein the error value is substantially equal to [1-X(n)/X(n-1)] and the error value is scaled before being added to the prior estimated value of 1/X(n) and a transition speed of X(n) and wherein the value of the scaling coefficient is based on the transition speed of X(n) as seen in Simanapalli et al.'s invention into the Patent 7,006,806 because it would enable to enhance the system performance (e.g. col. 2 lines 32-39).

Response to Amendment

9. The amendment filed 03/10/2010 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The limitations "wherein a control signal is used to change the variable transition speed of X[n]" in claims 1 and 36 and "wherein the value of the scaling coefficient is different from the error value" in claims 34 and 36 are considered as new matter introduce into the disclosure of the invention.

Applicant is required to cancel the new matter in the reply to this Office Action.

Response to Arguments

10. Applicant's arguments filed 03/10/2010 have been fully considered but they are not persuasive.

a. The applicant argues in pages 6-7 for claim 21 that the cited references do not disclose the added limitation “wherein a control signal is used to change the variable transition speed of X[n] and further the invention by Simanapalli only hold true when the envelope changes between adjacent samples are very small if the sampling rate is sufficiently high.

The examiner respectfully submits that the secondary reference by Simanapalli discloses in Figure 3 component 78 in which r[n+1] = r[n]*(2-r[n]x[n+1]) which is the same as, by changing symbol, y[n] = y[n-1] * (2-y[n-1]x[n]) = y[n-1] +

{y[n-1] – y[n-1]y[n-1]x[n]} = y[n-1] + y[n-1]*{1 - y[n-1]x[n]}. This expression is exactly same as Figure 4 of the claimed invention. Thus, Simanapalli clearly discloses the control signal as y[n-1] for controlling the variable transition speed of x[n] wherein y[n-1] = 1/x[n-1]. Further, the claimed invention does not exclude the hold true of Simanapalli. Therefore, Simanapalli clearly discloses the deficiency of the claimed invention from the primary reference.

b. The applicant argues in page 7 last two paragraph for claim 21 that Simanapalli uses Chevyshev approximation that require a limited and predefined interval in the which expansion is to be carried out.

The examiner respectfully submits that these allegations are not seen in the claims.

c. The applicant argues in page 8 for claim 34 that the cited references fail to disclose the added limitation "wherein the value of the scaling coefficient is different from the error value".

The examiner respectfully submits that the secondary reference by Simanapalli discloses in Figure 3 component 78 in which r[n+1] = r[n]*(2-r[n]x[n+1]) which is the same as, by changing symbol, y[n] = y[n-1] * (2-y[n-1]x[n]) = y[n-1] + {y[n-1] – y[n-1]y[n-1]x[n]} = y[n-1] + y[n-1]*{1 - y[n-1]x[n]}. This expression is exactly same as Figure 4 of the claimed invention which the scaling factor is

y[n-1] and the error is (1 - y[n-1]x[n]) or (1 - x[n]/x[n-1]) wherein y[n-1] = 1/x[n-1].

d. The applicant argues in pages 9-10 for claim 36 that the cited references fail to disclose the newly added limitations.

The examiner respectfully submits that these newly added limitations in claim 36 are also in claims 21 and 34 which fully addressed in the above responses to the arguments (a-c).

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHAT C. DO whose telephone number is (571)272-3721. The examiner can normally be reached on Tue-Fri 9:00AM to 7:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lewis Bullock can be reached on (571) 272-3759. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Chat C. Do/
Primary Examiner, Art Unit 2193

April 15, 2010